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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • MARCH 9, 1946

Radio And Radar

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Wave Makers

"A leaping trout awakens the still pool to life in waves that move in silent rhythm."

In the same way, when you speak over the telephone, vibrating electric currents speed silently away with the imprint of your voice over the wire and radio highways of the Bell System.

Tomorrow, the vibrations will be the living pictures of television. All are examples of wave motion.

How to produce, transmit and receive electrical wave motion is the basic problem of the communication art.

Bell Telephone Laboratories, which exist primarily to invent and develop better communications for the Bell System, devote the teamed efforts of physicists and mathematicians to the production and control of electric waves in all forms.

Out of these fundamental studies have come the discoveries which keep the Bell System at the forefront of the communication art.

BELL TELEPHONE LABORATORIES

EXPLORING AND INVENTING, DEVISING AND PERFECTING, FOR THE CONTINUED IMPROVEMENT OF TELEPHONE SERVICE

MEDICINE

New Penicillin Triumph

The drug saved a patient with blood disease following gold salts treatment for arthritis. Called most potent remedy for condition.

➤ A PATIENT so sick that on one day his physicians feared for his life was on the next day "suddenly almost well," thanks to penicillin which rescued him from agranulocytosis, serious blood disorder in which the white cells are lacking.

The case is reported by Maj. Edward W. Boland, Capt. Nathan E. Headley and Col. Philip S. Hench, of the Rheumatism Center of the U. S. Army, Hot Springs, Ark. (*Journal, American Medical Association,* March 2).

The patient in this case was a 39-year-old officer who had been getting gold salts treatment for chronic rheumatism. Some persons are sensitive to gold and are poisoned by the treatment even when it is carefully given. Agranulocytosis is one of the severe, potentially fatal conditions which may develop as it did in this officer's case.

Agranulocytosis may be caused by other chemicals, such as sulfa drugs; thiouracil, a new and effective remedy for toxic goiter; and certain coal-tar chemicals in headache remedies. The bone marrow in such cases is damaged so that it fails to produce white blood cells. When the body is robbed of these natural defenders, it is an easy prey to invasion by disease germs. It is this germ invasion that kills the patients.

Penicillin acts as a temporary substitute for the white blood cells, holding the germs at bay until the bone marrow can form a new army of defending white cells.

Prompt recoveries in 10 cases besides that of the officer have now been reported as a result of penicillin treatment of agranulocytosis.

Penicillin is now "the most potent remedy" for prevention or control of this dangerous condition, the medical officers state. In their opinion it allows for much more optimism about the outcome of the disease in future patients.

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FIRST TO LIVE—These Surinam toads at the zoological park in Washington, D. C., are the first to survive in captivity. Of the 26 born recently, 22 are still living and growing on a diet of white worms. They will be five inches long when full grown. Photograph by Fremont Davis, Science Service staff photographer.

METALLURGY

Low-Melting Gold Alloy

Gold-germanium alloy, 88% gold and 12% germanium, is hard and has superior wearing qualities. Is useful in jewelry and dentistry.

➤ A LOW-MELTING gold alloy with several other unusual properties was described at a meeting of the American Institute of Mining and Metallurgical Engineers in Chicago by Dr. Robert I. Jaffee of the Battelle Memorial Institute, Columbus, Ohio, where the alloy has been recently studied.

It is a gold-germanium alloy, 88% gold and 12% germanium. The latter is one of the less known metallic elements, but it is mined in the United States and is considerably cheaper than gold. The alloy melts at 673 degrees Fahrenheit, only 50 degrees higher than the melting point of lead. It is what scientists call a gold-germanium "eutectic," a term applied to an alloy with a lower fusing point than its components have by themselves. Gold melts at 1945 degrees Fahrenheit, and germanium at approximately 1760 degrees.

This eutectic is harder than ordinary gold alloys and has superior wearing qualities. These properties make it of value in jewelry. Another property of the alloy, Dr. Jaffee stated, is its slight expansion on solidification, which compensates for contraction in cooling to room temperature. Because of this property, he said, extremely precise castings, such as dental inlays, can be made, and these dental castings would require no correction to take care of shrinkage that occurs with most alloys.

Because of the low melting point of the alloy, it can be used as a solder by jewelers doing repair work on gold jewelry. They can obtain the necessary heat to melt it with a common gas flame. Gold-coated jewelry of long-wearing properties can be made by merely dipping the object to be plated into the molten eutectic.

This gold-germanium alloy is not entirely new to metallurgists. It was first mentioned in an obscure German publication, Dr. Jaffee said. But Battelle Institute has been conducting experiments with it to determine its best uses. The chief interest in the metal at the present, he stated, is its potentialities as a rectifier in radar equipment.

Germanium is produced as a by-product in the production of cadmium. It resembles silicon in appearance and is closely related to silicon in nature, he explained. It was first discovered by a German scientist in 1886, but little thought was given to its utilization until recent years. The U. S. Bureau of Mines states that germanium is a crystalline gray-white metal, with chemical properties intermediate between those of silicon and tin. While far from being abundant, germanium can be recovered in rather large quantities in the form of its oxide, as a by-product of zinc. Dr. Jaffee stated that about a ton a year is produced in America.

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ENGINEERING

Nazis Lagged in Rubber

Lack of prewar cooperation between production and tire industries responsible for slowness of progress in Buna rubber development.

➤ THE GERMAN rubber industry, postwar investigations by American scientists reveal, had not progressed relatively as far as the American rubber industry in the use of their Buna type synthetic rubbers, Earl W. Glen of the U. S. Civilian Production Administration told scientists attending a meeting of the Society of Automotive Engineers in Detroit. And this in spite of German pioneering work on synthetic rubber during the prewar years.

This particular session of the SAE is designated as a German Engineering Evaluation meeting, given largely to reports by specialists on technical matters concerning German automotive war equipment and such accessories as tires, fuels and lubricants. An exhibit of German military and automotive vehicles featured the meeting.

The backwardness in the German synthetic rubber program was attributed by Mr. Glen, whose permanent position is with the Goodyear Tire and Rubber Company, to a lack of cooperation between the synthetic production industry and the manufacturing companies using the product. This situation changed rapidly as Germany prepared for war, he said, but the opportunity for close cooperation in the development of better synthetics on a production scale was lost and the industry was obliged to accept existing materials just when it was necessary to go into large-scale production as Germany mobilized for war.

Tire and rubber goods manufacturers were very critical of the Buna rubber they were forced to use. Under pressure from them, I. G. Farbenindustrie developed Buna S-3, he said, which eliminated some of the production difficulties and improved the performance of rubber products, particularly tires. The development of Koresin for compounding with synthetic rubber to improve the tackiness facilitated tire and mechanical goods production.

German equipment for brass-plating metal goods to facilitate bonding synthetics to track blocks and bogie rollers was excellent, Mr. Glen stated. An improved method of bonding these articles was in process of development in the I. G. Farbenindustrie laboratories at Leverkusen "wherein a coating of a new chemical called Desmodur R could be applied more efficiently than brass plating and produced a more uniform and satisfactory bond." Desmodur R was also used as a tire cord dip and general tackifier in the German tire industry.

Luka Reifen and Draftband Reifen were interesting German developments. The first was a tire unit with a cellular solid rubber filler which was claimed to be very successful in operation without air. The Draftband Reifen was a tire without a steel base band, using bead wire embedded in a bevelled hard-rubber base as the surface to mount on a bevelled split rim.

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CHEMISTRY

New Elements Described to Young Science Winners

➤ TWO NEW elements that are not yet in chemistry textbooks were described to 40 high school scientists by an atomic scientist who helped discover the elements.

Dr. Glenn T. Seaborg, University of California chemist and co-discoverer of elements No. 95 and 96, even offered the youthful scientists a chance to help write the history of chemistry as he told them suggestions of names for the new elements were still being considered.

The atomic scientist spoke to the 29 boys and 11 girls at a meeting of the Science Talent Institute sponsored by Science Clubs of America, administered by Science Service.

Still unnamed, elements 95 and 96 were produced at the University of California by bombarding the 238 isotope of uranium and 239 plutonium with alpha particles, Dr. Seaborg reported.

He said that the new elements would probably fit in the chemists' charts as members of a new series of elements.

"The elements actinium, 89, thorium, 90, and protactinium, 91, are the first elements in this new rare-earth-like series which corresponds very much to the series of elements that begins with lathanum, which is farther down in the scale of atomic numbers," Dr. Seaborg explained.

Stressing the importance of element 94, plutonium, to chemistry as well as the atomic bomb, the University of California chemist pointed out that it was the first time in which laboratories had produced an element to prove that it existed in nature.

Admitting that the social and political consequences of the atomic bomb had outweighed scientific consideration in the public mind, Dr. Seaborg said that in the future work done in the development of the bomb will assume an important place in chemical history.

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***ALBINO GOPHER**—Two albino gophers were captured by a student in the Fillmore Joint Union High School, Fillmore, Calif., and this one was photographed by Dr. James E. Bliss. W. L. Hall, instructor in biology and physiology at the school, states: "These two animals were pure albinos, having even whiter coats and pinker eyes than my rats, which are of true Wistar strain."*

GENERAL SCIENCE

World University

Has been suggested to UNESCO from several quarters to encourage scientific research and higher education at international level.

By VICTOR COFMAN
Science Service Correspondent

➤ A WORLD UNIVERSITY is advocated from several quarters, who have communicated their suggestions to the Secretary of UNESCO, the United Nations, Educational, Scientific and Cultural Organization.

The Colombian delegation was among the first to ask for a University of the United Nations in order to encourage scientific research and higher education both in technical science and in other branches of human knowledge.

The International Committee for a World University Alliance of New York, created to promote the establishment of a world university, has submitted a scheme for a World University Charter.

Dr. Maxwell Garnett, formerly of the League of Nations Union, suggested that UNESCO should take steps for the creation by UNO of an international university, established mainly for research workers qualified in a number of fields.

Dr. Hugh Trowbridge (U.S.A.) proposed the establishment of a United Nations University in realization of Article 62 of the Charter. At the same time he suggested the creation of degrees for the United Nations, a program of study, means for promoting the scheme and a method for the selection of candidates for this university.

All these proposals, and many others dealing with the future work of UNESCO in the educational and allied fields, have been referred for further study to special committees.

Month of Culture

➤ A UNESCO month, during which lectures, exhibitions and films would bring out vividly the value of international cultural cooperation to the public has been agreed upon as an important early feature by the United Nations Educational, Scientific and Cultural Organization. The UNESCO Month is to precede the annual conference which, according to its Constitution, UNESCO must arrange every year in a different country.

These intellectual and artistic manifestations are designed to bring about the right atmosphere in the host country, and to provide at the highest level a discussion on current intellectual and spiritual problems. The host country would be stimulated to mobilize all its best intellectual and artistic resources to the advantage both of its own people and its distinguished guests, and these would enable the conference to start its proceedings in a spirit attuned to the nature of its task. It is not intended that this UNESCO Month should deal exclusively with the culture of the host country. Leading authorities in other countries would no doubt cooperate in this work of international understanding.

This scheme, which was put forward by the Executive Secretary of UNESCO, Sir Alfred Zimmern, was approved by the preparatory commission. The first UNESCO Month will probably be held in Paris next fall.

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CHEMISTRY

"Goop" Now Reducing Forest Fire Hazard

➤ "GOOP," the fire-spreading jelly that helped to lay Tokyo and other Japanese cities in ashes, is now playing a paradoxical role in saving American forests from fire. It does this by helping to burn, under watched and controlled conditions, the tops, branches and other debris left after logging operations, which form a bad fire hazard if left to themselves.

"Goop," whose more proper name is Pyrogel, is a greasy jelly containing magnesium powder. It was the most destructive of known incendiary bomb fillers at the end of the war. Another incendiary mixture, a liquid known as Napalm, also promises to be useful in removal of fire-hazardous forest slash.

The Army has about 50,000,000 pounds of "Goop" left on hand. It has no possible use except to start fires. To destroy it by burning would cost an estimated $200,000, and dumping it into the ocean would probably produce protests from conservationists. Hence any use that can be made of it in starting slash-removal fires is just so much cash saved to the taxpayers.

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Human hair grows faster in summer than in winter.

GENERAL SCIENCE

Science Talent Institute

Forty boy and girl winners in the Fourth Annual Science Talent Search, during honor-trip to Washington, are addressed by leading scientists.

See Front Cover

➤ THE YEAR'S talented young scientists of America attended the five-day Science Talent Institute in Washington (March 1-5) as the culminating event of the Fifth Annual Science Talent Search for the Westinghouse Science Scholarships. This educational event is conducted by the Science Clubs of America, administered by Science Service.

This issue of SCIENCE NEWS LETTER reports some of the highlights of the sessions. The next issue will continue this report.

The picture on the front cover of this SCIENCE NEWS LETTER, by Fremont Davis, Science Service staff photographer, shows Dr. J. A. Hutcheson and a group of winners after his talk on "Radio Location and Radar," given before the Science Talent Institute.

Dr. J. A. Hutcheson, associate director of Westinghouse Research Laboratories:

Radar, the device that played many important roles in winning the war, will find countless more uses in peacetime. Originally radar was a device to detect enemy planes. By the end of the war, it was used to guide friendly planes to their targets, fire guns and direct searchlights.

Amazing and varied as have been the wartime applications of radar, the peacetime potentialities of the field still remain largely untouched, but ready for scientific exploration and expansion.

Considering that vacuum tubes for radio used during World War I have since been developed to perform such tasks as welding, controlling the speed of motors, opening doors and sorting products, the future applications of radar's electronic tubes are beyond the imagination.

Tubes with the circuits built inside them and other radar tools can be built in quantities rivalling the production of standard radio tubes.

Radar has extended the radio frequency spectrum by 100 times. The tubes and other components that exploit these fantastic frequencies are so vastly different from the concept of comparable prewar equipment that the possibilities of different combinations of the components have not been explored.

Thus, television and frequency modulation that incorporate many improvements are at hand. Color television and three-dimensional reception are within our grasp. And radar in its present form —to aid navigation, control airplane traffic and afford point-to-point communication as does the Army's famed "walkie-talkie"—poses only minor conversion problems for such uses in peacetime.

Dr. Marshall Stone, Harvard University:

➤ ONE of the very important factors in the rapid progress of science and technology is a firm command of higher mathematics. Everyone realizes quite clearly that the advance of modern science has come to depend upon the availability of well-organized laboratories, expensively fitted out with all kinds of specialized equipment, such as the cyclotron, the betatron, and the wind tunnel. Not everyone realizes so clearly that the advance of modern science depends upon the existence and exploitation of a large body of subtle, highly ingenious mathematics, which is continually expanding, thanks to the persistent efforts of professional mathematicians.

Some of the most spectacular contributions of mathematics to the advance of our scientific knowledge deserve to be cited in illustration of this fact. They will show us, if we look at them carefully enough, some of the reasons why mathematics plays such an important part in scientific research and development and also some of the limitations upon its powers. Suppose we begin by giving our attention to the physical phenomena of radio. The essential physical fact on which we rely is the fact that energy can be propagated by radio waves over very great distances. How did this fact come to be observed and understood in its minutest details, with the consequence that, in due course, we are now able to enjoy this marvelous facility of communications? Clerk Maxwell was the mathematical father of radio.

History records that this great English physicist of the nineteenth century, casting the laws of electro-magnetism as observed by Faraday into a unified mathematical form, deduced from their mathematical statement the logical consequence that wave-propagation of energy should be possible. Looking back, we can summarize Maxwell's achievement in a sort of syllogism: Faraday's laws are confirmed by experiment; Faraday's laws imply wave-propagation; hence wave-propagation can be confirmed by experiment. It was several years before the conclusion was verified by the German physicist Hertz, who set up a suitably designed experiment and obtained the confirmation desired. It is, of course, futile in one sense to explore the "might-have-been"—but are we not reasonable in imagining that, in the absence of a mathematical analysis like Maxwell's, physicists might not have looked systematically for this confirmation and might not readily have understood or appreciated the nature of such observations as they might have stumbled on by chance? An equally spectacular instance of the power of mathematical analysis in dealing with physical reality is a quite modern one, to which very little attention has been paid outside professional circles. This was the discovery of the positron.

The positron's discovery was made in the laboratory by the contemporary American physicist Anderson but—and this is what I want to emphasize—the stage for this discovery had already been elaborately set by the mathematical theories of the English physicist Dirac. Dirac's brilliant formulation of the laws of quantum physics led him to the logical conclusion that Nature's observed behavior is such as to allow the electron to have a hitherto unsuspected twin, of equal mass but opposite electrical charge. Thus, when Anderson's observations were made, more or less by chance in the course of experiments directed toward other ends, they could at once be fitted into the general picture without any misgivings as to their implications for physical theory. If we try to put Dirac's contribution ex post facto into a syllogism, it would perhaps run somewhat as follows: the fundamental laws

of quantum physics, including those governing the electron, are confirmed; if the fundamental laws of quantum physics are correct, then both the electron and a twin particle, the positron, have equal logical claims to existence; hence, either the physical existence of the positron can be confirmed by experiment—or the fundamental laws of quantum physics must be supplemented by an additional principle or law which will have the logical effect of excluding the possibility of a particle like the electron.

A third spectacular example is Einstein's theory of relativity. Then there is Einstein's equation between mass and energy, deduced as a logical consequence of the physical principles of the special theory of relativity and published as long ago as 1905, which received experimental confirmation only a few years ago—and just now in 1945 received experimental and practical confirmation on so vast a scale as to become a matter of life-and-death interest to all the people of the world.

In a fundamental way mathematics is responsible for the atomic bomb. We cannot thoroughly understand the all-pervasive influence of mathematics upon the advance of other branches of science and technology by fixing our attention just upon the heroic achievements. Rather we must look to the more work-a-day relations, so little advertised, between mathematics and the different parts of scientific theory and practice. An adequate review would require more time than we have, so a few suggestive examples will have to suffice. It is, of course, in the great profession of engineering that we find the most practical and most familiar expression of modern science—and, at the same time, the commonest and most nearly indispensable applications of mathematics, particularly of its most anciently developed branches: geometry, algebra, and calculus. If we were to trace in detail the developments of the modern airplane, we should find it linked with the elaboration of a theory of flight, highly mathematical in character, which enables us to calculate the most useful shapes for wings, propellers, and other air-foils, and thus allows us to avoid expensive random experimentation in favor of well-directed experimental study of skillfully selected initial models.

Let's glance for a moment at the science of genetics, and we see the guiding influence of mathematical statistics at work upon the detailed development of those basic principles first noted by Gregor Mendel. By multiplying such illustrations we can fill in a picture in which the contributions of mathematics would be highlighted in almost every aspect of science. There are inner, natural reasons why mathematics is so inextricably woven into the development of science and technology. Nature, however mysterious, is at least not illogical, a principle which clearly encourages us to remain unsatisfied with mere observations upon the world about us and to proceed instead to reason about the facts established by observation. The application of reason or logic to the factual material derived from observation involves us at once in the use of mathematics, which is, after all, nothing more nor less than the art of precise, formal reasoning. The exhaustive study of the logical implications of the factual material of science marks out for us the limits between the possible and the impossible. Nature is in harmony with logic, and thus assists us through the refinements of mathematics to concentrate the costly efforts of experimental science and technology upon those enterprises which are calculated to be most promising or advantageous.

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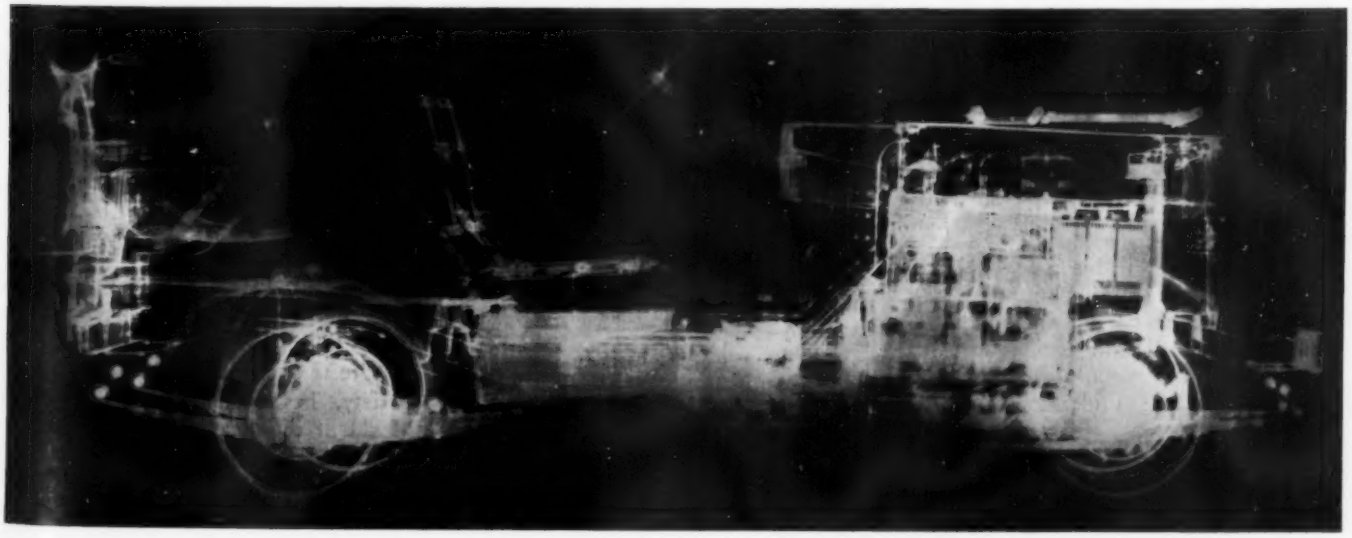
MEDICINE

German Measles Danger to Unborn Babies Questioned

➤ FEAR THAT when an expectant mother has an attack of German measles, her baby may be born with cataracts, heart disease, deaf-mutism or other deformities may be relieved if further statistical studies bear out one reported in the *Journal of the American Medical Association* (March 2).

The fear arose from Australian reports, backed up by reports from American physicians, of the frequency of congenital malformations in the children when the mothers had German measles early in pregnancy. (*Turn to page 156*)



GHOST JEEP—This is the first radiograph of an entire automobile and was made by the Eastman Kodak Company and the University of Rochester. During a ninety-minute exposure, the X-rays had to penetrate the closed door of the laboratory, the atmosphere, and the jeep to record the image on film. The results show that almost every part of the jeep is visible, from the headlight filaments to the fuel level in the gas tank.

AERONAUTICS

Folding-Wing Planes Save Money All Around

➤ AIRPLANES with folding wings save money for both flyers and airport operators. With folding-wing planes the cost of hangar construction per plane would be cut two-thirds or more, and the number of planes which could be accommodated at a small airfield greatly increased, stated John H. Geisse, assistant to the administrator for personal flying development, Civil Aeronautics Administration.

A standard-type hangar 56 feet square will hold only four airplanes in individual enclosures, Mr. Geisse said. Yet ten planes of the same size with folding wings could be stored in the same size building, each in a separate room with generous locker and bench space. The ten-plane hangar would cost the airplane operator substantially less than the present-day four-plane design, the saving being largely in the kind of doors used and in obviating the need for expensive trusses.

At present there is a serious shortage of small airports in the larger cities and as private flying increases it is expected to become critical. Being able to accommodate two or three times as many planes might make mid-city skyparks more attractive from an investment standpoint, Mr. Geisse pointed out, in calling on manufacturers to consider incorporating folding wings in their new-design personal planes.

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ENGINEERING

Individual Tickets Printed as Needed

➤ AIR TRAVELERS and railroad passengers will have less waiting in line when each ticket seller has a new ticket-printing machine, for his individual use, and also a series of push buttons which manipulate light flashes on a reservation board to tell him what spaces are available on a plane or in a Pullman. Both devices are under experimental tryout.

The printing machine on the ticket agent's bench is easy to operate. The agent sticks a two-by-two inch blank ticket into it, presses down the necessary keys, and it comes out with the starting point and destination printed. It also prints the date, the agent's identification, a serial number, and the cost of the transportation and the government tax. The complete process takes but a moment. Considerably less time is required than is now taken in the ordinary process of filling in the destination with a rubber stamp or pen and ink, and stamping the date on the ticket.

Another advantage of the ticket-printing machine, various models of which are now being tested in use by several railroads and airways, is that it makes a permanent record at the same time that it prints a ticket. At the end of his day, the ticket seller has no summary report to make up; it is all given in the machine.

One airline reservation office, at least, is trying out a visual automatic space system which is cutting the time required in making reservations. When a reservation is requested, the clerk presses one of the push buttons before him, and a light flashes on a large reservation board, placed where it can be seen by every reservation clerk in the room, showing what spaces, if any, are available on the particular plane desired.

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CHEMISTRY

New, Rich Source of Vitamin C Discovered

➤ A NEW, very rich source of anti-scurvy vitamin C has been discovered in the West Indian cherry. Dr. Conrado F. Asenjo and Dr. Ana Rosa Freire de Guzman, of the School of Tropical Medicine at San Juan, Puerto Rico, state that this is "one of the richest if not the richest edible fruit source" of the vitamin so far described in scientific literature. (*Science*, Feb. 22)

These cherries supply about 34 times as much vitamin C as oranges, it appears from the analyses of the Puerto Rican scientists which give the average vitamin C content of 100 gm of edible cherries as 1,707 mg. One cherry, it seems, would supply four or more times the amount of vitamin C recommended by nutrition authorities for the day's ration of this vitamin.

These cherries, commonly called acerola in Spanish, grow on small trees native to tropical and subtropical America. They are fleshy, bright red when ripe and have what the scientists call "an agreeably acid taste." About six of them would weigh one ounce.

Botanists will recognize these cherries under the name, *Malpighia punicifolia L.*, and will know that in spite of their common name, they are only distantly related to the cherry family.

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IN SCIENCE

MEDICINE

Epilepsy Remedy Controls Abnormal Behavior As Well

➤ TRIDIONE, a new compound recently reported effective in controlling petit mal epilepsy, also succeeds in controlling the psychomotor attacks which some epileptics have, Dr. Russell N. DeJong, of the University of Michigan Medical School, reports. (*Journal, American Medical Association*, March 2).

Patients with psychomotor attacks, or psychic equivalents or variants as they are also called, do not have convulsions in the attack though they may have some contortion of the trunk muscles or may stand immobile with a slow rotation of the body, Dr. DeJong points out.

Abnormal or automatic and sometimes violent behavior, with confusion and loss of memory for the attack, are the chief characteristics of psychomotor attacks. The patient may commit crimes during an attack. The seizure may last for a few minutes or many hours and the patient is usually not aware of what he is doing during an attack.

Dr. DeJong reports improvement, sometimes spectacular, in five cases treated with tridione. The drug is taken by mouth three times a day. Since most of the patients also had grand mal and petit mal attacks as well as the psychomotor ones, other drugs to control these were also needed.

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CHEMISTRY

Illinois Chemist Awarded Royal Society Medal

➤ DR. ROGER ADAMS, head of the department of chemistry of the University of Illinois and chairman of the board of directors of the American Chemical Society, has been awarded the Davy Medal of the Royal Society of London for his work in organic chemistry and his recent research in the alkaloid field.

Dr. Adams is now in Berlin as a special adviser to Lt. Gen. Lucius D. Clay, deputy military governor of the American occupation zone in Germany. During the war, he was in Washington with the NDRC.

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E FIELDS

BIOLOGY

Motherless Male Insects Produced in Laboratoy

➤ FEMALE INSECTS in the laboratory of Dr. Anna R. Whiting of the University of Pennsylvania have laid eggs and new male insects have hatched from the eggs—yet the females were not their mothers. They had no mothers at all, only fathers.

This biological paradox resulted from the treatment of the female insects, before mating, with heavy ultraviolet irradiation. This destroyed or disabled the heredity-bearing chromosomes in their still-unfertilized eggs. When they were subsequently mated with males and the eggs thus fertilized, nothing but male chromosomes were available to form the essential parts of the new nuclei. So the new insects grew up with no trace of maternal heredity; their characters were all derived from the male parents.

The insects used in Dr. Whiting's experiments were tiny, gnat-sized wasps known to entomologists as *Habrobracon juglandis,* which play a useful role in orchard economy by laying their eggs in the eggs of destructive species of moths. This is the first known instance of growth to full maturity of motherless individuals from irradiated eggs. As much as 35 years ago, early stages in animal development from such eggs were observed, but these animals with only male parents died during larval development.

This experimental production of animal forms with only the father's kind of chromosomes in their cells has been named androgenesis, which is Greek for "birth from a male."

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ELECTRONICS

Television on Bikini Will Give Close-Ups

➤ SUCH VARIED items as goats and television will play important roles in the atom bomb tests on Navy ships at Bikini Atoll in the Marshall islands this summer, Rear Adm. W. H. P. Blandy, commander of the task force, declared.

Admiral Blandy said television cameras on Bikini during the tests would give more distant observers a closer view of the experiments, while goats, pigs and sheep will be aboard the ships bombed to test biological reactions to the explosions.

On Bikini, the television cameras will be placed to give a clear picture of the lagoon where the tests will be made. Aboard the observing ships, the television screens will reveal closer pictures of the explosions than any observer could safely get otherwise.

Tethered to the decks of the ships, the animals will be closely examined after the bombings to determine some of the possible effects of the explosions on humans. The task force commander said that he regretted the necessity of using the animals, but declared that medical officers considered it essential to obtain more data on the bomb's effect on living animals, particularly in reference to shipboard conditions.

Admiral Blandy revealed that extensive preparations are already underway at Bikini for the tests. Minesweepers, now operating in the lagoon where the operations will be held, have destroyed 38 Japanese naval mines in the entrance, and they found five more mines washed up on one of the islands nearby. Hydrographic surveys are being made, and the ships that will be bombed are being made ready at Pearl Harbor.

The first test, aerial atom bombing of ships in the lagoon at Bikini, is now scheduled for May 15, while Admiral Blandy said the surface explosion will be done within four to six weeks after the first bombing.

The third atomic test, exploding a bomb underwater, will definitely not be conducted until next year, he reported.

Science News Letter, March 9, 1946

GENERAL SCIENCE

Pure Science Fellowships To Be Resumed

➤ FELLOWSHIPS to young scientists for work on pure science research projects in Westinghouse laboratories will be awarded in May, it is announced by the Westinghouse Electric Corporation, which is resuming a practice suspended during the war. Three will be chosen. The subjects of research will be left to them, and need not have direct immediate application to Westinghouse's needs.

To be eligible for selection the young men must have training equivalent to that represented by a doctor's degree from a recognized university. The fellowship has a value of $3,300 a year.

Science News Letter, March 9, 1946

PHYSICS

Meteorites Are Menace To Future Rocket Ships

➤ WHEN A ROCKET ship succeeds in rising into the upper atmosphere, it may have a catastrophic collision with a meteorite, warns Dr. Joseph Kaplan, University of California at Los Angeles, physicist.

Pointing out that the slowest meteorites speed into the earth's atmosphere at a velocity of about 30,000 miles per hour, Dr. Kaplan says that a rocket ship wouldn't have much chance in event of a collision. Faster meteorites, he adds, travel as fast as 180,000 miles per hour.

Upwards of 75,000,000 meteorites plunge into the earth's atmosphere every day, reports the physicist, but almost all of them are vaporized by friction with the air before they can strike the earth. If a rocket ship were sent into the upper atmosphere, he says, it might collide with a meteorite that had not yet vaporized.

Dr. Kaplan says that fortunately meteoric swarms are not very dense, with the most concentrated swarms averaging about one gram (1/30 ounce) of material in 20 cubic miles of space.

Science News Letter, March 9, 1946

ELECTRONICS

Standards of Electrical Resistance Changed Little

➤ BASIC STANDARDS of electrical resistance established over ten years ago are still good to one part in a million, the National Bureau of Standards has announced.

Since every measurement of energy and power made by the electrical industry depends ultimately on the correctness of the ohm and the volt, frequent comparisons are made with the group of standard resistors and standard cells maintained at the Bureau of Standards.

Intercomparisons of resistance standards conducted by James L. Thomas, chief of the section on resistance measurement at the Bureau, have shown wirewound resistors he designed and constructed over a decade ago to be superior to any previously used. They are so stable in value that, of a group of ten, not one had changed from the average value of the group by more than one part in a million, equivalent, to a change in linear measurement of about one foot in a distance of 200 miles.

Science News Letter, March 9, 1946

RADIO

Radio Hams Are Back

Thousands of amateur radio operators are back after the war with many of their prewar shortwave bands and a new field of radio communication.

By RON ROSS

➤ HAMS ARE BACK—but these hams aren't at the butcher shop. They're America's thousands of amateur radio operators who affectionately call themselves "hams."

Silenced by Pearl Harbor, amateur radio is back from the war with many of its prewar shortwave radio bands and a whole new field of radio communication open, according to latest assignments by the Federal Communications Commission.

Before the war there were nearly 60,000 hams licensed in the United States. "That's only the beginning," declares George Bailey, West Hartford, Conn., president of the American Radio Relay League. Mr. Bailey estimates that 100,000 Americans will hold amateur radio licenses by the end of this year, and that there will be 250,000 hams operating amateur stations within five years.

Who are these amateur radio operators? The American Radio Relay League says the average ham is about 30 years old. This mythical hobbyist has a 100-watt short wave station costing about $400 over a period of years. He constructed his own transmitter and probably purchased his receiver from a radio manufacturer.

"Ham" Qualifications

To qualify as a ham, the aspirant must be licensed by the Federal Communications Commission. Two licenses are required to operate an amateur station, one for the operator and one for the station. A would-be ham must be able to send and receive International Morse (Continental) code at a rate of 13 words per minute and demonstrate a thorough knowlege of radio.

More than half the applicants fail to get a license the first time they apply, but most of them return to pass the tests later. Some precocious youngsters have passed the test as young as 8. A few years ago amateur radio was a hobby for youngsters, but the average age for the hams is now 30 years.

By frequent use of cast-offs and reference to the local junkyard, many amateurs construct their stations for as little as $25. A complete station can be built of new parts for $50. One wealthy ham could have started a commercial radio station for the $100,000 he reputedly spent as an amateur.

Once licensed, the amateur has his own call letters assigned for his station. Ham stations are limited to 1,000 watts power, but most of them are 100-watters.

Hams have sent messages around the world with 5 to 10 watt stations, using one-fifth the power required by a home light bulb!

Through his station the amateur may make friends anywhere from a few miles to many thousands of miles distant. Radio topics are the common ground on which the amateurs meet, but the most casual listener to the shortwave bands knows that ham talk is not limited to science.

Radio amateurs vary, in the parlance of the hams, from the "ragchewer," who chats with familiar friends by the hour on any topic, to the "DX Hound," who conducts a continual search for new and faraway stations.

Amateurs have an abbreviated language of their own, some derived from varied sources and some unique to hams. "YL" refers to a "young lady." When she marries, she becomes an "XYL," and later an "OL." "OM" (for old man) is used for all male radio amateurs irrespective of age.

Though most ham stations are equipped to send either code or voice, an estimated 65% of the communicating is by code.

The radio amateurs have a distinguished history dating back to Marconi, who regarded himself as an amateur. By 1917, America had 6,000 hams from whom to draw the nucleus of the Armed Forces radio communications staff in World War I. Responding then as they were to do 25 years later, the nation's hams rendered valuable service in radio work at home and abroad.

Amateur radio expanded rapidly in the following decades, and the followers of Marconi found themselves prepared to perform an important service to the country in peace as well as war. With hams operating shortwave stations in homes, garages and sheds in nearly every community in the country, it was found that they could frequently maintain contact with other areas when disaster wreaked havoc with commercial phone, wire and radio services.

Thus in practically every major disaster where the forces of nature have destroyed ordinary communication lines when they have been needed most, it has been the hams who have brought aid to stricken areas. Sometimes it has been a neighborhood boy "playing" with his ham station in an attic that has saved lives and brought help when floods and storms have otherwise isolated communities.

In the disastrous New England flood of 1936, loss of life was negligible compared with past emergencies. The authorities gave the credit for this saving of lives to the amateur radio operators who stood watch at their small transmitters during the storm. Their reports of the storm and river levels and their

PIONEER "HAMS"—First amateurs to experiment with the new microwave bands, A. E. Harrison, W6BMS, Rockville Center, N. Y., and Reuben Merchant, W2LFG, Nassau, N. Y., used portable equipment to make contacts with stations 31 miles away.

"HAM" AT HOME—Member of the American Radio Relay League, William J. Halligan, W9WZE, Chicago, in this de luxe studio chats with friends around the world.

calls for food and medical aid saved many isolated areas from worse tragedy.

To cope with emergencies in any part of the United States and its possessions, the amateurs now maintain an Emergency Corps of selected hams who will be able to keep up a system of intercommunication wherever the need may arise. Organized by the American Radio Relay League, the Corps is made up of amateurs with portable equipment independent of local power lines who can take over when other means of communication are destroyed.

The national organization of the hams, the American Radio Relay League, was founded in 1914 through the inspiration of a distinguished radio amateur of his day. The late Hiram Percy Maxim, famed inventor, scientist and author, saw the need for an organized relay system among the hams to facilitate messages being sent long distances. At that time, limited ranges of shortwave transmission required a relay system. Today, when hams can send messages around the world, elaborate relay organizations are the nation's "communication insurance" in emergencies.

Pearl Harbor abruptly stopped amateur radio operations. Asked to go off the air the evening of December 7, 1941, the hams quickly relayed their last prewar message and ceased operating for the duration of the war. During the war the government used shortwave stations on the amateur bands.

The war, fought in the laboratory and at the control panels as well as behind the guns, brought many thousands of radio amateurs into the Armed Forces and war industry. These were some of the nation's best trained personnel to cope with the problems of wartime radio and electronics—trained by building and operating their own stations.

The Army and Navy eagerly sought the services of hams, finding that these men, accustomed to operating a radio station with a coil of wire, a pair of pliers and their own ingenuity, were well suited to keep sensitive equipment such as radar operating.

Now back from the war, amateur radio finds some of its prewar bands still being used by the Army and Navy, but even the "DX Hound" finds regulations limiting international communicating by amateurs have been lifted.

Returning, too, and eager to enter the fascinating and skilled pastime of the hams, are many thousands of men and women whom the Army and Navy have acquainted with radio and electronics during the war.

Postwar amateur radio has already entered a field opened by war-time discoveries. Amateurs are now invading the super-high frequencies of radar's microwaves. Limited in distance, microwave beams are narrower than ordinary waves and permit use of smaller antennas and directional equipment not practical at lower frequencies. This holds promises of more private, direct beam communications using midget antennas.

In first experiments with the new frequencies, amateurs talked to each other across 31 miles on a frequency of 5,300 megacycles using an antenna less than one-half inch long.

Stimulated interest in radio, plus the war-time discoveries, promise boom years for amateur radio. Meanwhile, President Bailey of the American Radio Relay League looks to the future when hams will be operating their own television stations.

Science News Letter, March 9, 1946

If you want to know how to become a radio ham or build an easily-constructed receiver, send two 3-cent stamps to SCIENCE NEWS LETTER, *1719 N St., NW, Washington 6, D. C., and ask for Bulletin R-10.*

TECHNOLOGY

Many Opportunities For Technical Men

➤ THOUSANDS of opportunities for technical men will exist during the next years in American industry, E. C. Wright of the National Tube Company told a meeting of the American Institute of Mining and Metallurgical Engineers in Chicago. The demand for metallurgical engineers will continue to grow, he said, and emphasized that students in preparation for this profession need thorough training in such fundamental sciences as physics, physical chemistry, thermodynamics and mathematics.

He based his statements on experience in steel metallurgy in training graduates from various types of college courses in the plants of the company he represents. He advocated a clear-cut college-industrial training program covering at least 10 years for recruiting undergraduates and graduate students each year, standard apprenticeship courses, with adequate pay rates and working hours and a training program best fitting each industry.

Cooperative arrangements should be made with selected colleges, he said, to insure that apprentices be obtained from a number of different schools, and every effort should be made to mobilize undergraduates for summer and vacation work as early as possible in their college courses. By these means, he predicted, the steel industry will build up a reservoir of metallurgical engineering talent.

Science News Letter, March 9, 1946

Do You Know?

Penicillin is now used in veterinary medicine.

The melting point of an *organic compound* is used to identify it and determine its degree of purity.

True *pheasants,* now abundant in the United States, are not indigenous to this country but are natives of Asia, especially of India and Indo-China.

Menhaden is an important fish in the paint industry because its oil is used in the manufacture of insulating varnishes and ship bottom paints.

Starch sponge, used in foods and absorbable surgical dressings, is made by mixing commercial starch in water, heating the mixture to form a paste and then slowly freezing the paste; when thawed it retains its sponge shape.

Synthetic rubber is said to be superior to natural rubber in the printing industry for inking rollers, printing plates, press blankets, and other rubber printing materials because it resists the chemicals in ink.

About half the qualified *psychologists* in the United States are employed normally in colleges and universities; the others are in clinics, penal and mental institutions, hospitals, government, state and other services.

Quick-frozen, precooked, ready-to-serve *complete meals,* in individual cardboard plates that resist water, heat and grease, will soon be available in retail stores; 20 minutes in a hot oven and they are ready for the table.

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BOTANY

NATURE RAMBLINGS by Frank Thone

Dry, But Not Warm

➤ JUST ABOUT NOW, or in a couple of weeks more at most, trees and shrubs will be unwrapping their buds and getting ready for another season of green growth. The varnished scales that have enclosed them for months have served their turn and are now discarded; they litter the ground at the base of the trees.

Almost inevitably, some one will liken them to garments that have kept the young leaves and flowers dry and warm all winter long and can now be shed. Warm-blooded egocentrists that we are, we think of plants in human terms.

We would be nearer the facts if we stopped at the halfway point in our nursery metaphor. For bud-coverings keep the buds dry—but not warm. The tight-packed beginnings of leaves and flowers within the closely shingled roofs of scales become zero-cold when the outside air drops to zero. Thanks to the condensed state of the little sap that is in them, resembling syrup or mucilage more than it does water, they do not actually freeze. If the cold should become so intense as to cause the formation of ice crystals in the buds, their delicate tissues would be torn and burst, and they would probably die. But this extreme state of affairs seldom comes to pass.

The real job of the bud scales is to keep outside water out, and inside water in. Wet snow may fall until every twig is "ridged inch-deep with pearl," freezing rain may sheathe all the trees and bushes with ice, but within the tight little houses of the buds the coming spring's leaves and flowers reck nothing of it. The scales are waterproof so that moisture cannot penetrate; they are tenacious against outside pullings and buffetings. Only the pressure of swelling new life within will serve to push them open and finally break them off.

Probably even more important than their function in keeping the buds dry is their opposite task of keeping them from drying out. Although the sap in over-wintering buds is considerably thicker and less watery than the sap in summer leaves, there is a limit to its tolerable concentration. Evaporation can kill buds. And evaporation can go on even in the coldest of winter weather: some of the driest deserts in the world are cold deserts, like the Gobi, and our own Great Basin area. Winter drought can be even crueller than drought in summer, for roots and stems are unable to replace evaporation losses with fresh moisture from the soil. Highly essential, therefore, is the role of the bud coverings in conserving the necessary minimum of water in the unborn leaves and flowers.

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From Page 151

It was even suggested that an abortion might be justified in case of German measles, or rubella as it is technically named, in an expectant mother.

These conclusions are not justified, Dr. Max J. Fox and Dr. Mortimer M. Bortin, of Milwaukee, Wis., state. They base this on investigations of cases of German measles recorded at the Milwaukee health department. Among 22,226 cases reported in 1942, 1943 and 1944, eleven were expectant mothers. One of these subsequently had a stillborn child and one had twins, both normal. The others presumably gave birth to normal babies. One gave birth to a child with congenital cataracts following a normal pregnancy, but when she had German measles while pregnant the baby was normal.

A well-organized survey from other health department records should be conducted, the Milwaukee physicians advise.

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The *drum of the ear* is only about 0.004 inch thick, yet it vibrates millions of times every day with sound waves hitting on it.

Aluminum is being recovered chemically from obsolete airplanes; caustic soda dissolves out the aluminum in the scrap, leaving bolts, nuts and other foreign materials untouched and reducing the alloying metals to a sludge that may be separated out.

MEDICINE

Scleroderma Weapon

A chemical closely related to vitamin D has proved successful in treating the strange hidebound condition of the skin.

SUCCESSFUL treatment of scleroderma, the strange hide-bound condition of the skin sometimes seen in "the man who turned to stone" of the circus sideshows, is reported by Dr. Eugene T. Bernstein and Dr. Lewis A. Goldberger, of Mount Sinai Hospital, New York. (*Journal, American Medical Association,* March 2)

A chemical closely related to vitamin D is the remedy they used. The name of the chemical is dihydrotachysterol. This chemical does not have the anti-rickets action of vitamin D, but it exerts a powerful effect on calcium utilization in the body.

The cause of scleroderma is not known but in recent years scientists have found that the calcium metabolism is disturbed in this condition. In some patients the amount of calcium in the skin was increased by about 30% which seems to give a good basis for the "turned to stone" description of the patients. Their skin is also described as leathery, boardlike, hidebound and glistening with a characteristic ivory white sheen. It cannot be picked up between finger and thumb. The face looks like a mask.

The patient reported by the New York physicians had an operation for thyroid gland enlargement a year before she developed scleroderma. Damage during the operation to the neighboring parathyroid glands, which play an important part in regulating calcium metabolism, was suspected. For this reason dihydrotachysterol was given. The response was "almost dramatic," the physicians state, and her skin returned to its normal condition except for some areas of color change.

Science News Letter, March 9, 1946

ELECTRONICS

Television in the Sky

Experiments now being carried out on relay stations carried in blimps. If successful, it will give a wider television range.

TELEVISION broadcasting from relay stations carried aloft in blimps is now proposed, and General Electric Company engineers in Syracuse, N. Y., are experimenting with relay equipment installed in this type of lighter-than-air craft to study increased relay range of a station at varying altitudes. A somewhat similar scheme is under investigation by the Westinghouse Electric Corporation, using airplanes traveling in lazy circles high above the earth.

The experiments of General Electric are part of a broad program of research to determine the best methods of relaying television—a necessary step if television programs are to have wide range. Direct programs from television stations rarely extend beyond the horizon, usually less than about 50 miles. For wider range of television transmission through the air by radio waves, booster or relay stations are necessary. Ground stations for this purpose have to be erected about 35 miles apart. By the use of stations far above the surface of the earth, either in planes or blimps, the number of relays can be very much reduced, it is expected.

With the use of coaxial cables, television, of course, is transmitted long distances, but this type of electric cable is expensive. Radio-wave transmission will probably prove less costly provided too many relay stations do not have to be erected and maintained. The Bell System will soon be in a position to make determining comparisons between coaxial transmission and transmission by ground-based relay stations with its new coaxial installation between New York and Washington, and the other between New York and Boston. The value of airborne stations is a matter of future determination.

If Westinghouse engineers are correct, one station in a plane slowly circling over New York at an elevation of 30,000 feet would deliver direct television radio waves to both Washington and Boston, and to the area between these cities and far to the west of New York. The plane-carried relay they propose would blanket the earth's surface like a giant ice-cream cone, covering an area 422 miles across.

General Electric, in its initial blimp relay tests, operated an airship over territory between Schenectady and New York. It is an area where General Electric, and Globe Wireless, Ltd., will operate an experimental radio relay network. The companies already have government permission to erect ground booster stations between these two cities, and also between New York and Washington.

Science News Letter, March 9, 1946

Protein can be removed from peanut meal by treating it with mildly alkaline water and then acidifying the solution.

Bunches, or stems, of *bananas* vary in weight from 22 to 62 pounds, with the average bunch received in the United States weighing 50 pounds.

A new Russian *helicopter* of metal construction has two motors and airscrews placed on either side of the fuselage and joined to it by a metal frame.

The most common and deadly *cancer* is that of the stomach; about one-half of all cases of cancer in men, and one-third of those in women, involve cancer of the stomach.

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ELEMENTARY BACTERIOLOGY—Joseph E. Greaves and Ethelyn O. Greaves—*W. B. Saunders*, 613 p., tables and illus., $4, 5th ed. A textbook, revised to cover recent advances including antibiotics, especially penicillin; electron microscope; new material in influenza, Rocky Mountain spotted fever, infantile paralysis, etc.

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THE NUTRITION OF INDUSTRIAL WORKERS—*National Research Council*, 33 p., tables, free. An appraisal of dietary deficiencies among industrial workers and suggestions for the development of nutrition programs.

PROTECTION FOR ELECTRIC MOTORS—E. S. Shepardson—*N. Y. State College of Agriculture*, 12 p., tables and illus., 5 cents. Description and use of motor overload protective devices. Cornell Extension Bull. 673.

RADAR: What Radar Is and How It Works—Orrin E. Dunlap, Jr.—*Harper*, 208 p., diagrs. and illus., $2.50. A simple explanation for the layman.

A REVIEW OF BLOAT IN RUMINANTS—*National Research Council*, 53 p., tables, 25 cents. Fourth report of the Committee on Animal Health.

SCIENCE FOR YOUNG MEN—A. Frederick Collins—*D. Appleton-Century*, 257 p., diagrs., $3. For those interested in entering any branch of the aviation industry; includes chapters on surveys, and maps, photography, electricity, radio, meteorology, gliders, ground work in aviation, and air navigation.

THE TECHNIQUE OF THE PICTURE STORY: A Practical Guide to the Production of Visual Articles—Daniel D. Mich and Edwin Eberman—*McGraw*, 239 p., illus., $3.50. Reference book for general public and free-lance writers who want to learn the goals and methods for picture-magazine publishing.

WINDOW LABORATORIES—Gustave B. Timmel and E. L. Palmer—*N. Y. State College of Agriculture*, 31 p., illus., 10 cents. Suggestions for the use of school room windows in nature study projects. Cornell Rural School Leaflet: Vol. 39, No. 2.

WINGS OVER AMERICA: The Future of Air Power—John Stuart—*Public Affairs Committee*, 31 p., diagrs., 10 cents. Discussion of the research and development necessary to maintain our air power. Public Affairs Pamphlet No. 114.

Science News Letter, March 9, 1946

METEOROLOGY

Weather Stations to Get Cloud Measuring Device

➤ THE CEILOMETER, a delicate electronic instrument for measuring the altitude of clouds, will soon be in operation at 140 weather stations in the United States, reported W. R. Thickstun, chief, instrument division, Weather Bureau, Department of Commerce.

Capable of measuring the heights of clouds up to 15,000 or 20,000 feet in daylight and up to 30,000 feet at night, the new instrument was developed during the war.

The ceilometer consists of two separate instruments, a powerful arc-light projector which flashes a beam of light into the sky to reflect from the base of a cloud layer, and a photo-electric cell or electronic eye mounted in a telescope-like apparatus, that picks up the reflected light beam. Measurements are computed in a similar manner to that used with a mariner's sextant, with a triangle formed by the two parts of the ceilometer and the cloud layer.

Science News Letter, March 9, 1946

AERONAUTICS-METEOROLOGY

All-Weather Flying Tests In Thunderstorms Planned

➤ SPECIALLY equipped fighter planes will be flown by Army Air Forces pilots in the area of Orlando, Fla., during the worst spring and summer thunderstorms.

The planes will collect instrumental and photographic data on cloud forms and heights, turbulence, precipitation, lightning and temperature.

Ten P-61 Black Widow night fighters will make flights to get the observations and will also test various methods of using radar to find safe paths through storm areas. Army experts hope to use the information from these tests to develop flight procedure and techniques that will reduce the hazards of flying through storms, the War Department reported.

Science News Letter, March 9, 1946

MEDICINE

A-BombRadiationSickness

Jap victims suffered sickness similar to that seen in patients who get sick following massive doses of X-ray or radium.

➤ JAP VICTIMS of the atomic bomb suffered "true forms of radiation sickness" similar to that seen in the United States in patients who get sick following massive doses of X-ray or radium, Comdr. Joseph J. Timmes, Navy medical officer, reports. (*Naval Medical Bulletin*, Feb.)

Comdr. Timmes was one of the first American physicians to see atomic bomb patients in Japan. Aboard the U.S.S. Wichita, he steamed into Nagasaki Ko on Sept. 11, 33 days after the atomic bombing and about 10 days before the arrival of the various scientific commissions.

Fever, a sick feeling, loss of appetite, bleeding gums and bloody diarrhea were the symptoms complained of by the average patient when first brought to the hospital for treatment of A-bomb sickness. Their teeth were loosened and could easily be removed by hand. Gold fillings subsequently examined contained radiant energy. Many lost much of their hair but at the end of a month a few had begun to grow new, downy hair. Whether the baldness will be permanent is at this time "purely speculative," Comdr. Timmes states.

A large percentage of the early victims, it can be assumed, died of the effects of the radiant energy released by the atomic bomb, Comdr. Timmes reports.

The idea that the area would continue to be dangerously radioactive, however, is dispelled by Comdr. Timmes' findings.

"Our first concern was the amount of radiant energy possibly remaining in the area and in the victims," he states. "X-ray film buried in the bombed area and attached to various objects about the so-called crater (a true crater does not exist) failed to reveal the presence of radioactive elements. Later the other investigators, with the aid of Geiger point counters, reported the area to be safe and found only negligible amounts of radiation.

"X-ray films were then attached to the limbs of atomic victims at the hospital and kept in place for 18 hours. All of these films failed to reveal radiation, which may be explained by the fact that although these patients were exposed to forms of radiant energy they did not absorb any in large amounts."

The principal effect of the radiation on the patients was on the bone marrow. Most of them suffered from an aplastic type of anemia. Their blood was deficient in red cells and hemoglobin. A number of patients with about a fifth or sixth the normal number of white blood cells were seen and in some cases the white cells disappeared completely before death. Only a few cases of X-ray skin burns and those mild in character were seen.

Many of the patients died as the result of infection attacking them after the bombing, particularly bronchopneumonia. In general, the younger persons had more recuperative abilities but it was difficult to determine the prognosis in the various cases.

Japanese attempts to treat the patients had been meager because most of their medical supplies had been depleted. A primary school had been converted to a hospital, since the hospital and medical school of Kyushu University at Nagasaki had been destroyed. The Japanese gave the patients small amounts of vitamins, liver extract and occasionally a blood transfusion.

The U. S. Navy group had rather limited supplies for treating these patients. The penicillin and plasma had "the anticipated beneficial effects."

Science News Letter, March 9, 1946

CHEMISTRY

De-Gassing Molten Metals Subject of New Patent

➤ GETTING undesirable gases out of molten metals is the problem attacked by the process on which Arthur T. Cape of Columbus, Ohio, was awarded patent 2,395,458. It was already known that this could be accomplished by getting the metal into intimate contact with carbon dioxide, but previous attempts to accomplish this have not been very successful. Mr. Cape turns the trick by using, not gaseous carbon dioxide, but the solidified form known commonly as "dry-ice." This is submerged in the molten metal by various means; it of course vaporizes rapidly and in bubbling through the hot liquid carries off the contaminating gases.

Science News Letter, March 9, 1946

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Science News Letter, March 9, 1946

⚙ *NIGHT BINOCULARS, developed for Navy pilots and lookouts, have an exceptionally wide field of vision and a non-reflecting coating on the exposed surfaces of the glasses to permit transmission of the maximum amount of light. With them the range of night vision is greatly extended.*

Science News Letter, March 9, 1946

⚙ *SLEEPING BERTHS rotate upward into concealment in the wall by pressing a button which operates a mechanism that works on a self-counterbalance principle. The upper berth is a complete unit, the lower is the rear of the back of a divan; either can be placed in position for use alone.*

Science News Letter, March 9, 1946

⚙ *ELECTRIC pig-brooder not only keeps very young pigs warm but keeps them away from their mother, thus lessening the usual high death rate from crushing as the sow moves around. It is a low shelter in the farrowing pen, heated with an overhead 100-watt lamp and reflector.*

Science News Letter, March 9, 1946

⚙ *COIN MACHINES, in which "hot dogs," hamburgers and grilled cheese sandwiches within sealed wrappers are heated almost instantly by radio waves, will soon be common in public places. The picture shows the mirror-topped machine with a sandwich in the electronic heating chamber and another being removed below.*

Science News Letter, March 9, 1946

⚙ *CELESTIAL sighting device, by which air and surface ship navigators may take bearings by the stars in daylight, looks like a combination telescope and surveyor's instrument. Attached to the lower end of the tube of the instrument is an eyepiece turret with three eyepieces, and within the tube is a prism that bends the light rays through 90 degrees.*

Science News Letter, March 9, 1946

⚙ *SNOW TRACTOR has a rhomboid-shaped frame so that its sloping front easily mounts the snow. Sprocket wheels on the four corners carry the endless cleated traction belt, one wheel on each side being powered by a gasoline engine. The tractor, designed to pull a dog sled, is steered from the front or rear by projecting handles.*

Science News Letter, March 9, 1946

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 301.

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